

ArevaEPRDCPEm Resource

From: RYAN Tom (AREVA) [Tom.Ryan@areva.com]
Sent: Monday, March 03, 2014 1:49 PM
To: Wunder, George
Cc: HOTTLE Nathan (AREVA); GUCWA Len (EXTERNAL AREVA); UYEDA Graydon (AREVA); RANSOM Jim (AREVA); LEIGHLITER John (AREVA); WILLIFORD Dennis (AREVA); RYAN Tom (AREVA); ROMINE Judy (AREVA); DELANO Karen (AREVA); WILLS Tiffany (AREVA); BALLARD Bob (AREVA); WHITE David (AREVA); Hearn, Peter
Subject: Advanced Response to US EPR DC Final RAI 605, Chapter 10, Question 10.04.09-14 - Auxiliary Feedwater System (PWR) (BPPF 7234)
Attachments: Advanced Response to RAI 605 Question 10.04.09-14 US EPR DC.pdf

George,

To support a final response date of May 15, 2014, an Advanced Response for RAI No. 605, Question 10.04.09-14 is provided in the attached file, "Advanced Response to RAI 605 Question 10.04.09-14 US EPR DC.pdf".

To keep our commitment to send a final response to this question by the commitment date, we need to receive all NRC staff feedback and comments no later than **April 14, 2014**.

Please let me know if NRC staff has any questions or if this response can be sent as final.

Sincerely,

Tom Ryan

Manager, US EPR DCD
Regulatory Affairs

AREVA

7207 IBM Drive - CLT2B

Charlotte, NC 28262

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From: HOTTLE Nathan (EP/PE)
Sent: Thursday, November 21, 2013 9:15 PM
To: george.wunder@nrc.gov
Cc: michael.miernicki@nrc.gov; bill.gleaves@nrc.gov; peter.hearn@nrc.gov; GUCWA Len (External RS/NB); UYEDA Graydon (EP/PE); LEIGHLITER John (RS/NB); RANSOM Jim (RS/NB); RYAN Tom (RS/NB); WILLIFORD Dennis (RS/NB); ROMINE Judy (RS/NB); DELANO Karen (RS/NB); WILLS Tiffany (CORP/IND); BALLARD Bob (EP/PE)
Subject: Response: US EPR DC Final RAI 605, Chapter 10, Question 10.04.09 - Auxiliary Feedwater System (PWR)

George,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 605 Response US EPR DC.pdf," provides a schedule since a technically correct and complete response to the single question cannot be provided at this time.

The following table indicates the respective pages in the response document, "RAI 605 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 605 — 10.04.09-14	2	2

The schedule for a technically correct and complete response to the question is provided below.

Question #	Advanced Response Date	NRC Comment Request Date	Final Response Date
RAI 605 — 10.04.09-14	March 14, 2014	April 14, 2014	May 15, 2014

Sincerely,

Nathan Hottle

AREVA Inc.
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Lynchburg, VA 24501
Phone 434-832-3864
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nathan.hottle@areva.com

From: Miernicki, Michael [<mailto:Michael.Miernicki@nrc.gov>]
Sent: Tuesday, October 22, 2013 11:00 AM
To: ZZ-DL-A-USEPR-DL
Cc: Dias, Antonio; Stubbs, Angelo; Hearn, Peter; Segala, John; Gleaves, Bill
Subject: US EPR DC Final RAI 605, Chapter 10, Question 10.04.09 - Auxiliary Feedwater System (PWR)

Attached please find the subject request for additional information (RAI). A draft RAI was provided to you on September 05, 2013. On September 10, 2013, AREVA informed us that, the RAI is clear and does not contain proprietary information and that no further clarification is needed.

The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs,. For any RAIs that cannot be answered **within 30 days or November 21, 2013**, it is expected that a date for receipt of this information will be provided to the staff within the 30-day period so that the staff can assess how this information will impact the published schedule.

Thank You,

Mike

Michael J. Miernicki
Sr. Project Manager
NRC/NRO/DNRL/LB1
301-415-2304

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 4817

Mail Envelope Properties (88F9B30A3139B1498DA89BEBA7B31B900B73B217)

Subject: Advanced Response to US EPR DC Final RAI 605, Chapter 10, Question 10.04.09-14 - Auxiliary Feedwater System (PWR) (BFP 7234)
Sent Date: 3/3/2014 1:48:50 PM
Received Date: 3/3/2014 1:48:59 PM
From: RYAN Tom (AREVA)

Created By: Tom.Ryan@areva.com

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Tracking Status: None

Post Office: FUSLYNCMX03.fdom.ad.corp

Files	Size	Date & Time	
MESSAGE	3813	3/3/2014 1:48:59 PM	
Advanced Response to RAI 605 Question 10.04.09-14 US EPR DC.pdf			66755

Options

Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal

Expiration Date:
Recipients Received:

Advanced Response to

Request for Additional Information No.605

10/22/2013

U.S. EPR Standard Design Certification

AREVA NP Inc.

Docket No. 52-020

SRP Section: 10.04.09 - Auxiliary Feedwater System (PWR)

Application Section: 10.4.9

SRSB Branch

Question 10.04.09-14:

The mitigating strategy proposed in DCD Rev. 5 for core cooling during a extended loss of all AC power (ELAP) event uses the fire protection system diesel-driven fire pumps to deliver fire-protection-system water to the SGs through the EFW system. The water pumped from the fire protection system enters the EFW system via an EFW discharge cross-connect header. When the system is operated, the potential for water hammer may exist due to pump starts and stops, control or isolation valve operation, check valve closure, etc. The occurrence of water hammer can result in damage to the emergency feedwater system. 10 CFR 50, Appendix A, GDC-4, "Environmental and Dynamic Effects Design Basis," requires safety-related portions of the EFW system be protected against hydraulic instabilities such as water hammer events. Provide a discussion of specific design features and system operation considerations used to minimize or preclude water hammer events due to operation of the fire protection system to supply water to the SGs. Include this information in the Design Control Document (DCD) and provide a markup in your response.

Response to Question 10.04.09-14:

System design features and proper operational procedures shall be utilized to minimize the occurrence of water hammer events.

The system design features to prevent water hammer are described in:

U.S. EPR FSAR Tier 2, Section 10.4.9, "Emergency Feedwater System," which states:

"The EFWS piping is routed to minimize the potential for destructive water hammer during startup. The EFWS piping connects directly to the SGs so it is not directly impacted by pressure transients in the main feedwater (MFW) piping. The EFWS piping continuously rises from the containment penetration to the connection with the SG. Each EFWS injection path also includes a check valve within the containment. Within the SGs, the EFW flow is routed through a split ring header.

EFWS flow exits the ring header via vertical tubes so that the ring header is maintained full of water."

U.S. EPR FSAR Tier 1, Table 2.2.4-3, ITAAC Item 3.13, establishes that:

The EFWS is designed in accordance with ASME Section III requirements. As such, an analysis of water hammer events shall be part of the ASME Code Section III report(s) for the system, and thus addressed

For in-design testing requirements, U.S. EPR FSAR Tier 2, Section 14.2.12.6.3, Secondary Feed and Bleed (ELAP) (Test #053) establishes that:

Prevention of water hammer during use of the fire water system for SG makeup is addressed by additional testing, demonstrates proper operation of the fire water distribution system (FWDS) feed to EFW (secondary feed and bleed) system following an ELAP event. This includes verification that diesel driven fire pump starts/stops, valve realignments, of the cross-connects occur without introducing water hammer.

The system operational considerations to prevent water hammer are also described in U.S. EPR FSAR Tier 2, Section 10.4.9, which states:

“Piping in the EFWS is required to be maintained full of water. Procedures are required to assure that the piping is properly filled, vented, and maintained full of water. System maintenance and operating procedures will also include guidance and precautions to be exercised during system and component testing when changing valve alignments or when starting or stopping of pumps.”

Operational considerations to prevent water hammer during alignment of the fire pump for steam generator (SG) makeup for emergencies, or if required for testing, are implemented by coordinating an Emergency Operating Procedure (EOP) for ELAP, and the preoperational test procedure found in U.S. EPR FSAR Tier 2, Section 14.2.12.6.3, “Secondary Feed and Bleed (ELAP) (Test #053).” Procedures developed for ELAP are based on the guidance provided in NEI 12-06. As noted in ANP-10329, Revision 0, “U.S. EPR Mitigation Strategies for Extended Loss of AC Power Event”, U.S. EPR FSAR Tier 2, Sections 13.5 and 19.2.5 include guidance for EOPs, Severe Accident Mitigation Guidelines, and Extensive Damage Mitigation Guidelines. U.S. EPR FSAR Tier 2, Section 13.5 discusses the U.S. EPR requirements for use of site-specific information for administrative, operating, emergency, maintenance, and other operating procedures.

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.

Technical Report Impact:

Technical Report ANP-10329, Revision 0, “U.S. EPR Mitigation Strategies for Extended Loss of AC Power Event” will not be changed as a result of this question.